

What is claimed is:

1. A method for developing a photoresist pattern on a substrate comprising:
mixing, in a fabrication facility where the substrate is processed, a concentrated chemical solution with a solvent to obtain a diluted chemical solution of a predetermined concentration;
applying the diluted chemical solution onto the photoresist pattern;
analyzing the photoresist pattern after the applying; and
adjusting the predetermined concentration based on the analysis of the photoresist pattern.
2. The method of claim 1, wherein the mixing, applying and adjusting are performed in a wafer track.
3. The method of claim 1, wherein the concentrated chemical solution comprises a surfactant.
4. The method of claim 1, wherein the solvent is de-ionized water.
5. The method of claim 1, wherein the solvent is developer.
6. The method of claim 1, wherein the diluted chemical solution has a concentration within a range from 10 ppm to 300 ppm.
7. The method of claim 1, wherein the analyzing and adjusting comprise:
inspecting the photoresist pattern to detect a defect; and
setting an alternative concentration based on analysis of the defects.
8. The method of claim 7, wherein the inspecting is performed with one of a defectivity monitoring tool, a Scanning Electron Microscope and a scatterometry tool.
9. The method of claim 7, wherein the inspecting comprises detecting pattern collapses.

10. The method of claim 1, wherein the predetermined concentration of the diluted chemical solution depends on the physical and chemical characteristics of the photoresist and on the pattern to be printed on the substrate.

11. The method of claim 1, wherein the predetermined concentration of the diluted chemical solution is determined by computer simulation.

12. The method of claim 1, wherein the mixing is performed in a nozzle, the mixing comprising:

flowing the concentrated chemical solution in the nozzle in a non-laminar regime; and
flowing the solvent in the nozzle in a non-laminar regime.

13. The method of claim 12, wherein the nozzle comprises a nozzle body having an undulating surface.

14. The method of claim 12, wherein the applying comprises discharging the volume defined by the nozzle on the substrate.

15. The method of claim 1, wherein the mixing is performed in a mixing tank

16. The method of claim 1, wherein the concentrated chemical solution is a solution selected from the group consisting of sodium hydroxide, potassium hydroxide and tetramethylammonium hydroxide.

17. An apparatus for developing a photoresist pattern on a substrate comprising:

a supply line of concentrated chemical solution;

a supply line of solvent; and

a nozzle, said nozzle comprising a nozzle body on which a first inlet, a second body and an outlet are arranged;

wherein:

the supply line of concentrated chemical solution is in communication with the first inlet;
and

the supply line of solvent is in communication with the second inlet.

18. The apparatus of claim 17, wherein the nozzle body comprises a mixing flow surface.
19. The apparatus of claim 17, wherein the concentrated chemical solution and the solvent are flowed in the nozzle body in a non-laminar regime.
20. A method for optimizing a post develop rinse on a substrate comprising:
mixing, in a fabrication facility where the substrate is processed, a concentrated chemical solution with a solvent to obtain a post develop rinse solution of a predetermined concentration;
developing a latent image on the substrate to form a developed photoresist pattern;
applying the post develop rinse solution onto the developed photoresist pattern;
analyzing the developed photoresist pattern after the applying; and
adjusting the predetermined concentration based on analysis of the developed photoresist pattern.
21. The method of claim 20, wherein the mixing, developing, applying and adjusting are performed in a wafer track.
22. The method of claim 20, wherein the concentrated chemical solution comprises a surfactant.
23. The method of claim 20, wherein the solvent is de-ionized water.